## REMARKS

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action of June 15, 2004.

Reconsideration of the Application is requested.

### The Office Action

Claims 1-18 were presented for examination.

Claims 3, 4, 8-15, 17 and 18 were withdrawn by the Examiner based on restriction requirements issued in a previous Office Action. Therefore, claims 1, 2, 5-7 and 16 were examined.

Claim 16 stands rejected under 35 U.S.C. § 112, second paragraph.

Claims 1, 2 and 6 stand rejected as being anticipated by Jiang et al. '630.

Claim 5 stands rejected as being anticipated by Wagner et al. '599.

Claim 7 stands rejected as being unpatentable over Jiang et al. '630.

Claim 16 stands rejected as being unpatentable over Jiang et al. '630, and further in view of Applicants' admitted prior art.

### Restriction Requirement

Applicants respectfully request the Examiner to re-reconsider the restriction requirement, at least as directed to claims 3, 4 and 10-15. In particular, Applicants submit the Examiner's interpretation of combination and sub-combination restrictions is unduly narrow and not within the intent of such restrictions. Particularly, the Examiner's interpretations are so sever that substantially any dependent claim which adds an additional element would be restricted. Such a position is not believed appropriate.

It is also inconsistent. Applicants so not appreciate why the further description of the substrate layers in claim 6 is appropriate, but the further description of the semi-transparent sensor having an anti-reflection coating is not. In both cases, these are not new elements, but rather claim 8 is simply further defining the semi-transparent sensor to include an anti-reflection layer, much like the layers which are discussed in claims 6 and 7.

For these reasons, Applicants again request the Examiner to reconsider the restriction requirement at least to claims 3, 4 and 8-15.

**Claim 1 is Distinguished from the Cited Art**

As may be noted from a review of the application and FIGURES 1-2, the present application is directed to an improvement of a system such as system 10 of FIGURE 1, which is intended to illustrate an existing VCSEL-based optical transmitter package. Provided is a TO Can 12, a sensor 16, a light source 18, a beam splitter 20 and a focusing lens 22, among other elements.

A difficulty with this package, is the complicated packaging techniques which are necessary to align the laser 18, the photodiode 16, the splitter 20 and the fiber 26. As stated on page 2 of the application, inclusion of these elements results in high packaging costs and a higher percentage than desirable of defective systems. It is estimated that when used for transmitters, ninety percent of the manufacturing cost is directed to the packaging (page 2, lines 24-28).

Therefore, a concept of the present application was to design a system which would reduce the packaging costs. FIGURE 2 shows the packaging design contemplated by the present application. In this optical transmitter system 40, a semi-transparent sensor 42 is used in an arrangement where laser 18 is positioned on substrate 14 behind semi-transparent sensor 42. By this design, a number of the elements of FIGURE 1 are not required.

A similarity between both FIGURE 1 and FIGURE 2, however, is that the components (*e.g.*, laser 18 and transparent sensor 42) are designed as separate individual components. On the other hand, the Jiang et al. '630 patent is directed to the construction of a monolithically-formed integrated device. Particularly, shown in FIGURES 1 and 2 (of Jiang et al. '630), the device provided is discussed as being constructed in accordance with thin-film technology, including a series of known deposition and patterning steps performed to fabricate the different layers. Thus, the device of Jiang et al. '630 employs thin-film techniques to construct a single monolithic device. On the other hand, again, the device of claim 1 is composed and comprised of individual components which are bonded or otherwise connected such as shown, for example, in FIGURES 3 and 4 of the present application.

While in the present application, the sensor device may be formed using thin-film techniques, it is done separately from the formation of the laser package. As seen in FIGURES 3 and 4, such connection may be made by solder bumps 56 and 58, implementing, for example, flip chip technology or other forms of integrating the components of the systems.

A benefit achieved by the concepts of the present application, as opposed to the thin-film techniques of Jiang et al. '630, includes employing optimized fabrication processes for the laser and the sensor individually. Whereas employing the integrated thin-film techniques for the entire device as in Jiang et al. '630, means compromises must be made, since both the laser and transparent sensor must employ the same manufacturing processes.

Employing the concepts of the present application therefore permits for the possibility of having a more optimized device not possible by Jiang et al. '630.

Claim 1 has been amended to emphasize that the semi-transparent sensor will be manufactured separate from the light-producing device on a semi-transparent substrate. The semi-transparent substrate is then bonded to the light-producing device at a location where the semi-transparent sensor is positioned in front of the light-producing device. Thus, amended claim 1 clearly shows that the light-producing device and semi-transparent sensor are manufactured separate from each other.

This is, of course, different from the thin film techniques of '630, where the device is grown directly on the VCSEL substrate. Therefore, in this device, the design of the laser will be influenced by the design for the detector and how the detector is going to be applied. This does not permit for the independent optimization obtained in the present application.

With attention to the rejection of claim 2, it was argued that the upper DBR 116 of the Jiang et al. '630 patent would read on the claimed semi-transparent substrate of claim 2. However, as stated in the '630 patent, the second stack 116 is a stack of distributed Bragg reflectors. Within these reflectors, an optical path is defined to reflect and guide light formed in an active region or area 118. Applicants have amended claim 2 to clearly show that the semi-transparent substrate is a quartz substrate. In actual implementation, the quartz substrate of the present application would not be equivalent to the second layer 116 as applied. Having the Bragg reflectors and requiring the formation of an optical path would create undue complexity having no benefit to the final device. Therefore, it is respectfully submitted claim 2 does not read on the present DBR 116 layer as cited in the Office Action.

As claims 5-7 further define now-distinguished claim 1, it is submitted these claims are also distinguished.

Turning to claim 16, it is argued in the Office Action that as Applicants noted there were emitters emitting in the wavelength of 1.1 to 1.7 microns, it would have been obvious to one of ordinary skill in the art to provide a detector for sensing light in that wavelength. The basis of the Examiner's position is that Jiang et al. '630 teaches that the photoconductor may be of "any suitable material (col. 4, line 6-)."

Applicants respectfully traverse this conclusion. In particular, it is Applicants' position the language "may be composed of any suitable material" provides no teaching whatsoever. This is simply a phrase that provides no details and would not assist a reader in building an "appropriate" device. On the other hand, as depicted in FIGURES 12-19b, and discussed in the text supporting these figures, when the wavelength of the laser being implemented changes, specific configurations to provide usable outputs are disclosed by Applicants. No such teaching is provided by Jiang et al. '630. For example, it is understood in the present application, as discussed on page 12, that when designing semi-transparent sensors for long wavelength operation, *i.e.*, greater than 1.3 microns, it is necessary to pay particular attention to the selection of the electrode material as ITO becomes increasingly absorbative at long wavelengths. It is noted that if ITO is used, its thickness, oxygen content and position relative to the other layers needs to be optimized.

In the discussion of FIGURES 12-19b, Applicants set forth particular configurations which they have discovered for such optimization. Claim 16 now clearly claims a device that will function within range as described in the present application. No such device is taught or fairly considered in Jiang et al. '630 which would operate above 850 nanometers.

For these reasons, it is respectfully submitted claim 16 is distinguished.

New claims 19 and 20 are provided to further define the concepts of the present application.

Claims 17 and 18 are cancelled, without prejudice.

## CONCLUSION

For the reasons detailed above, it is respectfully submitted all claims remaining in the application, including those which have been withdrawn based on the restriction requirement, are now in condition for allowance. An early notice to that effect is therefore earnestly solicited.

In the event the Examiner considers personal contact advantageous to the disposition of this case, he/she is hereby authorized to call Mark S. Svat, at Telephone Number (216) 861-5582.

Respectfully submitted,

FAY, SHARPE, FAGAN,
MINNICH & McKEE, LLP

Nov. 10, 2004
Date

Mark S. Svat
Reg. No. 34,261
1100 Superior Avenue, 7th Floor
Cleveland, Ohio 44114-2579
(216) 861-5582

N:\XERZ\200292\3A\KMF0004899V001.DOC